

What is claimed is:

1. A crystallization machine for a mouth on a bottle blank, comprising:

5 a conveying mechanism, providing two parallel cycling conveyers, being located at a middle part thereof, carrying a plurality of loaders, and each of the loaders providing a post with a fitting part for fitting with the mouth of the bottle blank;

10 an input zone, being located at a lateral side or two opposite sides of the crystallization machine at a lower part thereof, further comprising a feed element, a shift device connecting with the feed element, and a positioning slide rail being joined to the shift device, and the shift device being 15 in conjunction with the conveyer or the two conveyers in series;

a heater zone, being disposed at an upper part thereof;
a cooling zone, being disposed next to a rear end of the heater zone;

20 a releasing zone, being disposed at the lower part thereof next to the input zone;

a rear cooling zone, being disposed under the releasing zone next to a middle part of the releasing zone; and

25 an output zone, connecting with the rear cooling zone;
whereby, a plurality of plastic bottle blanks at the input zone are delivered by the conveyer ~~or the conveyer to~~ the heater zone at the upper part of the crystallization machine, and are turned to the releasing zone at the lower part of the crystallization machine via a rear end of the conveyer; and 30 then the crystallized plastic bottle blanks are removed outward

the output zone.

2. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the shift device further comprises:

5 a rotary disk with a gear like periphery for locating the bottle blanks,

a central shaft with a transmission gear disk extending upward from the rotary disk,

and a protect carrier surrounding the rotary disk

10 to prevent the bottle blanks from falling out;

wherein, the rotary disk provides two connecting ends to connect with the feed element and the positioning slide rail respectively, and a gap between any two teeth on the rotary disk aligns with a gap between any two teeth on the transmission gear so as to be inserted by a loader on the conveyer or on 15 one of the conveyers for driving the input rotary disk.

3. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein a meshing part is disposed above the fitting part on the loader for meshing with conveying gear disk. *Antecedent in claim 2*

20 4. The crystallization machine for a mouth on a bottle blank according to claim 2, wherein a plurality of ascend wedges are vertically movably attached to and disposed under the rotary disk and each ascend wedge has a tilt bottom; and a 25 roller is disposed near the rotary disk to be slidably contacted by the tilt bottom such that the ascend wedges can move upward during rotating with rotary disk.

30 5. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the positioning slide rail has a slant guide surface extending from the input rotary disk

to the conveyer or the conveyers so that the bottle blank can be moved along the slant guide surface and inserted into the loader so as to move with the loader.

6. The crystallization machine for a mouth on a bottle
5 blank according to claim 1, wherein the post on the respective loader supports the bottle blank thereon to prevent a threaded area of the mouth on the bottle blank from being softened by the heat of the heater zone and being deformed by the weight of the bottle blank *it self.*

10 7. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the post on the loader has an air aperture to discharge the air in the bottle blank out of the loader.

8. The crystallization machine for a mouth on a bottle
15 blank according to claim 1, wherein the conveying mechanism a plurality of stripping plates and each of the stripping plates has a through hole respectively corresponding to a support ring on the respective plastic bottle blank for detaching the bottle blanks from the loaders.

20 9. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the heater zone provides a set of upper heat sources for heating a threaded area of the mouth on the respective bottle blank and a set of lower heating sources for heating the loaders.

25 10. A crystallization machine for a mouth on a bottle blank, comprising:

30 a conveying mechanism, providing one cycling conveyer or two parallel cycling conveyers, being located at a middle part thereof, carrying a plurality of loaders, and each of the loaders providing a post with a fitting part for fitting

with the mouth of the bottle blank;

an input zone, being located at a lateral side or two opposite sides of the crystallization machine at a lower part thereof, further comprising a feed element, a shift device 5 connecting with the feed element, and a positioning slide rail being joined to the shift device, and the shift device being in conjunction with the conveyer or the two conveyers in series;

a heater zone, being disposed at an upper part thereof;

10 a cooling zone, being disposed next to a rear end of the heater zone;

a releasing zone, being disposed at the lower part thereof next to the input zone;

a rear cooling zone, being disposed under the releasing zone next to a middle part of the releasing zone;

15 and

an output zone, connecting with the rear cooling zone,

20 two non-touch type infrared sensors, being disposed at a rear side of the heater zone, one of the sensors detecting a temperature at a threaded part of the mouth on the bottle blank, and the other sensor detecting a temperature of the loaders with feed back control system to control the temperature at the loaders for the bottle blanks being stripped easily.

25 whereby, a plurality of plastic bottle blanks at the input zone are delivered by the conveyer or the conveyer to the heater zone at the upper part of the crystallization machine, and are turned to the releasing zone at the lower part of the crystallization machine via a rear end of the conveyer; and then the crystallized plastic bottle blanks are removed outward 30 the output zone.

11. The crystallization machine for a mouth on a bottle blank according to claim 10, wherein the shift device further comprises:

5 a rotary disk with a gear like periphery for locating the bottle blanks,

 a central shaft with a transmission gear disk extending upward from the rotary disk,

10 and a protect carrier surrounding the rotary disk to prevent the respective plastic bottle blanks from falling out;

 wherein, the rotary disk provides two connecting ends to connect with the feed element and the positioning slide rail respectively, and a gap between any two teeth on the rotary disk aligns with a gap between any two teeth on the transmission gear so as to be inserted by a loader on the conveyer or on one of the conveyers for driving the input rotary disk.

15 12. The crystallization machine for a mouth on a bottle blank according to claim 10, wherein a meshing part is disposed above the fitting part on the loader for meshing with transmission gear disk.

20 13. The crystallization machine for a mouth on a bottle blank according to claim 11, wherein a plurality of ascend wedges are vertically movably attached to and disposed under the rotary disk and each ascend wedge has a tilt bottom; and 25 a roller is disposed near the rotary disk to be slidably contacted by the tilt bottom such that the ascend wedges can move upward during rotating with rotary disk.

30 14. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the positioning slide rail has a slant guide surface extending from the input rotary disk

to the conveyer or the conveyers so that the respective plastic bottle blank can be moved along the slant guide surface and inserted into the loader so as to move with the loader.

15. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the post on the respective loader supports the respective bottle blank thereon to prevent a threaded area of the mouth on the respective plastic bottle blank from being softened by the heat of the heater zone and being deformed by the weight of the respective bottle blank 10 it self.

16. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the post on the loader has an air aperture to discharge the air in the bottle blank out of the loader.

15 17. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the conveying mechanism provides a plurality of stripping plates and each of the stripping plates has a through hole respectively corresponding to a support ring on the respective plastic bottle blank for 20 detaching the respective plastic bottle blank from the loaders.

18. The crystallization machine for a mouth on a bottle blank according to claim 1, wherein the heater zone provides a set of upper heat sources for heating a threaded part of the mouth on the respective bottle blank and a set of lower 25 heating sources for heating the loaders.